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COLLAGEN AS THE SUBSTRATE FOR SINGLE CELL PROTEIN PRODUCTION

FPRF has sponsored research for more than three years on the conversion of collagen to single cell protein. The results have been summarized periodically in "The Director's Digest." The most recent summary was presented in the September, 1971 issue.

During the past few months, rather dramatic increases have been attained in the productivity of the bacterial fermentation of SP100. Recent reports from Dr. Porsche and Dr. Brown show that the productivity increased with increasing substrate concentration (Table 1). In this series of experiments protein yield decreased with increasing substrate concentration and productivity. However, more recent experiments show that both protein yield and productivity increase with increasing substrate concentration if a mineral supplement is added to the medium (Table 2).

Recent data have shown that productivity can be maintained at a high level during at least five cycles of substrate through the fermentor.

The data suggest that oxygen concentration in the fermentor is currently the limiting factor in the growth of the bacteria. Excessive foaming is a problem if higher aeration rates are used. (Currently 3 volumes of air per minute are pumped through the fermentor.)

What about costs? A preliminary cost-analysis indicates that the cost of single cell protein produced from collagen would be approximately 20 cents per pound of protein. This is close to the cost of microbial protein produced from petroleum. At this cost it could not compete with other protein sources in livestock feed in the USA. If the isolated microbial protein has unusual function characteristics it might be competitive as human food.

Table 1. Influence of Substrate Concentration on Productivity and Yield of Single Cell Protein

SP100 Conc. %	Productivity g/l/hr.	Protein Yield %
1.0	0.4	-
2.0	0.8	70
3.0	0.95	60
5.0	1.2	55
7.5	1.5	55
10.0	1.8	50

Table 2. Influence of Mineral Supplement and Substrate Concentration on Productivity and Protein Yield of Single Cell Protein

SP100 Concn. %	Productivity g/l/hr.		Protein Yield %	
	No Suppl.	Suppl.	No Suppl.	Suppl.
1.0	0.7	0.6	90.7	59
3.0	1.0	0.7	71.0	71
5.0	1.6	1.7	57.4	87
7.5	-	1.8	-	93
10.0	1.8	-	50	-

FAT AND SUCROGLYCERIDES IN DAIRY CATTLE RATIONS

The enclosed reprint describes research sponsored by FPRF at Arizona State University some years ago. The results show that neither animal fat nor sucroglycerides in dairy cattle rations had any significant effect on milk production or milk fat levels at ambient temperatures in Arizona.